

other serious complication. On the contrary, well-designed studies have shown that children with special needs, such as premature infants with respiratory compromise, infants with symptomatic gastroesophageal reflux, and infants with upper airway problems such as Robin's anomalad, fare better sleeping prone.

It must be emphasized to parents of healthy newborns that although associated with SIDS, prone sleeping does not cause it; and infants who insist on sleeping prone still have a low "actual risk" of SIDS. Most important, research must continue in this area so we may discern the variables that lead to this association or to disprove this association.

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Management of Intracranial and Spinal Cord Vascular Lesions in Children

MANY ADVANCES HAVE occurred in the past five years in the management of intracranial and spinal cord vascular lesions in children. These advances include improved diagnostic abilities (magnetic resonance imaging [MRI]), new interventional neuroradiologic techniques, and focused radiation therapy (radiosurgery).

The introduction of MRI has revealed vascular lesions not seen on angiography, such as cryptic vascular malformations, also known as angiographically occult vascular malformations. These lesions have been diagnosed with increased frequency because of their characteristic appearance on MRI of the mixed-signal intensity of recent and remote hemorrhage. Cryptic vascular malformations commonly produce seizures, repetitive bleeding, neurologic deficits, and, in some cases, death. The pathologic features of these malformations continue to be debated. Most can and should be removed by modern microsurgical techniques. The reported morbidity of this surgical procedure has been low even when it involves the brain stem or the motor or language cortex.

The diagnosis and management of a second disease process, intracerebral and spinal cord arteriovenous malformations, have undergone dramatic improvement. Magnetic resonance imaging can detect and localize them, often before catastrophic hemorrhages have occurred. Interventional neuroradiologic and surgical techniques can obliterate these high-risk abnormalities. Preoperative embolization in conjunction with intraoperative angiography has made "unresectable" arteriovenous malformations surgically excisable with minimal morbidity and mortality. For children with these lesions and a seizure disorder, the malformation is surgically excised in conjunction with intraoperative motor mapping and electrocorticography to remove the seizure focus. Radiosurgery has also been successfully used in children who have arteriovenous malformations in critical areas of the brain or who are thought to carry a substantial neurologic risk with surgical treatment. Both the gamma knife and linear accelerator have shown effectiveness in treating small (less

than 3 cm) arteriovenous malformations. These lesions are progressively obliterated over two to three years after radiosurgery. The incidence of transient or permanent radiation damage is in the range of 2% to 4%, but complete obliteration occurs in more than 80%. To date, there is no evidence that secondary tumors are induced as the result of radiosurgery.

Combined arterial and transvenous interventional neuro-radiologic techniques have dramatically improved the prognosis for infants born with a vein of Galen malformation associated with high-output congestive heart failure, previously a fatal condition.

Despite these many advances, some rare vascular malformations are not amenable to current neurosurgical therapies. These include arteriovenous malformations that diffusely permeate the brain stem and giant vascular malformations that involve an entire hemisphere. With a better understanding of the pathophysiology of vascular lesions and continued improved technologies, even these rare lesions may soon be corrected.

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Laparoscopic Surgery

LAPAROSCOPIC SURGERY is gaining acceptance among pediatric surgeons and their patients around the world. Appendectomy, cholecystectomy, Nissen fundoplication for gastroesophageal reflux, herniorrhaphy, colectomy, vagotomy, and splenectomy have all been done laparoscopically. In addition, the laparoscope can be used in children to evaluate abdominal pain of unknown cause, for treating undescended testes, and for doing biopsies of lymph nodes and tumor.

To do a laparoscopic procedure, the child must be under general anesthesia with the stomach and bladder decompressed. A retractable blunt-tipped needle is inserted through a stab wound just inside the umbilicus, and a cannula is inserted into the abdomen to fill it with carbon dioxide to a pressure of 10 to 12 torr. The procedure is then done. Laparoscopic procedures have been done on infants weighing as little as 2 kg.

Laparoscopy offers the benefits to children of decreased perioperative pain, shorter hospital stays, and an earlier return to unrestricted activity including sports. Postoperative ileus is less common after laparoscopy than after conventional operations. The decrease in length of hospital stay, however, is less pronounced in children than in adults. Children are known to recover quickly after conventional operations, and many of these procedures are generally done on an outpatient basis. The average decrease in hospital stay after a laparoscopic procedure compared with an abdominal operation is one day for an appendectomy and two days after a cholecystectomy.

Possible complications include visceral injury during trocar introduction and difficulty with ventilation when patients are insufflated with too great a pressure. Carbon dioxide absorption also poses the possibility of hypercapnia with

carbon dioxide narcosis and respiratory acidosis. With experience, tissue injury and major hemorrhage are rare. Many of the complications seen in adult laparoscopic procedures result from the use of lasers or monopolar electrocautery. As safer bipolar instruments are introduced, the incidence of these types of injuries will decline.

Whether a surgeon chooses to do a procedure laparoscopically depends to a large extent on experience, training, and the long-term outcome of some of the procedures. For example, the incidence for the recurrence of inguinal hernia and gastroesophageal reflux following fundoplication could be greater than that from conventional repair.

Thus far, the results of laparoscopic operations in children are encouraging. As the instrumentation improves, surgeons will gain experience with more complicated reconstructive procedures. Laparoscopic surgery will be applied more frequently in children and in many cases will obviate a more extensive surgical procedure and prolonged hospital stay.

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Depot Levonorgestrel (Norplant) Use in Teenagers

NORPLANT (long-acting depot levonorgestrel) is well established as a contraceptive for women. It is especially well suited for women who wish long-term contraception, substantial birth spacing, a method independent of self- or partner participation (compliance) or timing of coitus, and avoidance of other contraceptives that have caused important side effects (such as intrauterine devices or estrogen).

Although there is no published information on the use of Norplant in teenagers, an adolescent service has used it in hundreds of teenagers.

Norplant consists of six flexible silastic capsules containing the hormone levonorgestrel. These capsules are inserted subdermally into the underside of a woman's upper arm through a surgical incision, usually in an outpatient setting. Norplant inhibits ovulation and thickens cervical mucus, thus making it impenetrable to sperm.

Levonorgestrel has been used widely in both progestin-only and in combined oral contraceptive pills. Now with the delivery method changing from oral to implantable, Norplant has become the most effective, reversible, long-term contraceptive available. It does not rely on patient compliance and therefore virtually eliminates all pregnancies for five years. Every year, one of every ten teenaged girls between ages 15 and 19 becomes pregnant, resulting in more than a million pregnancies in this age group in 1990 alone. Thus, based on the high number of unintended teenaged pregnancies in the United States, many of which are due to a lack of compliance, Norplant may prove to be the ideal contraceptive for some teens.

Norplant is by no means a panacea. Eight of ten women using Norplant report heavy, irregular bleeding. This common side effect is the primary reason for discontinuing its use. In addition, public health concerns have surfaced regarding the potential for a decrease in the use of condoms with Norplant and thus an increase in the risk of sexually transmitted diseases, including human immunodeficiency virus infection and hepatitis B.

Ethical issues have been expressed regarding Norplant's possible use in a coercive manner by parents or health care professionals or by its use in "targeted groups." Health care professionals must be vigilant to make sure this does not occur. Norplant is but another contraceptive choice and should be offered to teenagers as one of many options available to them. The final choice must be their own.

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